**Developing new rainwater management strategies through integration of technologies, institutions and policies for Blue Nile Basin, Ethiopia**

About 80 million extremely poor and food-insecure people live in the water scarce and highly degraded Blue Nile basin of Ethiopia. Crop-livestock based agriculture is predominantly subsistence, low-yielding and rainfed (>95%). Rainfall, runoff and sediment losses are erratic and dry spells significantly reduce crop yields and sometimes lead to total system failure. Historically, sustainable productivity-enhancing innovations did not happen until recently and the entire agricultural, economic and institutional system lost its resilience leading to periodic famines and perpetual food insecurity. Agricultural production is dominated in the highlands by low input-low output rainfed mixed crop-livestock production. To meet the needs of growing populations and to restore landscapes to more productive conditions with sufficient ecosystem services for all stakeholders, there is a need to reverse land degradation and improve productivity of crop-livestock system.

A consortium of researchers and local partners under the *CGIAR Challenge Program on Water and Water and Food* is implementing an innovative Nile Basin Development Challenge Program with a goal to improve rural livelihoods and their resilience through a landscape approach to rainwater management. The project is based on the premise that improved water management can be an important part of increasing land and water productivity, producing more food at a lower cost, generating employment and fostering equitable economic growth. In these rainfed farming systems of Ethiopian highlands, dramatically increased water productivity and crop production can be achieved with small amounts of water, if timed to mitigate yield losses from dry spells and other needed inputs are available. Livestock management such as feeding strategies has a role in increasing water productivity and integration of livestock typically results in higher water and economic productivity when compared to similar systems without livestock. However, further analysis showed that the existing model of both extensification and intensification of agriculture and allied activities are increasing pressure on water and other natural resources, enhancing climatic vulnerability through reduced ecosystem services and threatening to undermine long-term productivity. Approaches to improving livelihoods and resilience need to take into account complex linkages between different components of agricultural and livelihood systems- technological innovations, institutional coherence and inclusive policies. As past development interventions are more disappointing and research also has taken a limited view by focussing excessively on the cropped fields during the main rainy season only; the present research adopted a landscape approach where water (and related) needs of crops, livestock, trees and other ecosystem services both during the rainy and non-rainy season to enhance productivity and improved livelihoods were considered.

To operationalize these concepts the Project has selected three representative study sites in the *Woredas* of Fogera (north-east of Abbay basin, east of Lake Tana), Diga (southwest of Abbay basin) and Jeldu (south of Abbay basin). The three *woredas* represented a range of agro-ecologies with varied annual rainfall,were at different levels of degradation of the landscape and ecosystem services but all faced serious seasonal water scarcity. For detailed and continuous hydrological monitoring and assessment of the impacts of the large-scale interventions one river watershed was selected in each of the watershed – Mizewa watershed in Fogera (27 km2), Dapo watershed in Diga (18 km2) and Meja watershed in Jeldu (96 km2). Through comprehensive analysis of the bio-physical, social, economic and institutional settings at each location the project devised a set of specific strategy, practices and interventions for each site. A ‘bright spot’ anchoring community was also identified for ease in communication and validation of new ideas and interventions. To ensure continued and broad-based stakeholder participation ‘Learning Alliances and Innovation Platforms (LA&IP)’ have been setup at the watershed, *woreda*, regional and national levels. These LA&IP have memberships (about 10 to 12 persons) from a range of community, research, public and private development, market, finance, non-governmental organisations, donors and policy making institutions. The project has been able to demonstrate a paradigm-shift in its approach *“instead of developing a few small watersheds through some interventions and showcase this as a success; rather develop, demonstrate and change the entire process and policy of landscape development through inclusive and informed interactions at all levels.”*  Some of the early successes of actual demonstration and stakeholder participation in the process of integration of technologies, institutions and policies include: (i) participatory approach towards hydrological and meteorological monitoring for improved rainwater management (ii) estimation of the impact of the conservation practices on increase in base flow of the rivers/ local water sources during non-rainy season and its gainful use for productive agriculture, livestock and homestead and domestic uses, (iii) mapping of the past degradation of ecosystem services and putting in the interventions benefitting especially the landless, marginal and women stakeholders, (iv) vibrant and effective Learning Alliances and Innovation Platforms at all levels ensuring inclusive development and ownership by the institutions and alignment of the short-and long term policies and investments with the needs and aspirations of the community, (v) capacity building of the community and its leadership, local and regional researchers (including students), development practitioners and policy planners, and (vi) innovative documentation and dissemination of the most significant change stories and their impact.

It presents validation of a unique hypothesis which moves away from “improve the rainfed watersheds” to “improve the rainfed landscapes through improving the process of change”. The innovation is the integration of technologies, institutions and policies at different scales in Ethiopian highlands.

The research helps in closing the yield gap, arresting resource degradation and improving livelihoods in rainfed regions of Sub-Saharan Africa. Other applications are participatory hydro-meteorological monitoring, mapping of ecosystem resilience and establishing the effective Innovation Platforms.